Exhibit #3

From: Stead, Mike
Sent: Wednesday, December 18, 2013 12:58 PM
To: Bergeron, Rodney
Cc: Toliver, Aaron; Leka, Kathy
Subject: FW: 04.0998 - 24th Ave., Harvel, IL - State Packet
Importance: High

FYI...

From: Klinger, Stephen J. [mailto:stephen.klinger@nscorp.com]
Sent: Wednesday, December 18, 2013 12:29 PM
To: Stead, Mike
Cc: Toliver, Aaron; Wimberly, Cayela J.; Bankieris, Gus B
Subject: 04.0998 - 24th Ave., Harvel, IL - State Packet
Importance: High

Dear Mr. Stead:

Please reference the state's request from September 18, 2013 for project T13-0086 regarding the installation of flashing lights and gates with constant warning circuitry at 24th Ave. in Harvel, Montgomery County, Illinois DOT: 480031W, Milepost: D-422.78.

Attached in PDF Format are the detailed engineering, cost estimate and material list for this project. Please furnish the appropriate authorization to proceed with installation including contact information for the field representative to contact to coordinate any outside work.

Thank you,
Stephen Klinger | Highway Crossing Signal Engineer | Norfolk Southern Corp. | 1200 Peachtree St. NE, 8th Floor | Atlanta, GA 30309 | T: 404.582.6412

18-Dec-13

Detailed Estimate for Grade Crossing Warning Devices

City/State: HARVEL, IL
Road: 24TH AVE
MilePost: D-422.78
DOT/AAR: 480031W
State Proj. No.:
County: MONTGOMERY
S&E Proj. No.: 04.0998
File Number:
Man Days: 180

Purchases - Others		
Meals and Lodging:	$24,192.00	
Rental of Equipment:	$25,200.00	
(2 Trucks, 1 Backhoe w/ Trailer and 1 Pipe-Pusher for 30 Days)		
Construction Supervision Vehicle:	$4,503.14	
Purchases - Other Total:		$53,895.14
Material And Additives		
Material Cost:	$176,858.00	
Sales and Use Tax:	$8,843.00	
Material Handling Freight:	$8,842.92	
Material Total:		$194,543.92
Labor And Additives		
Labor Cost:	$50,400.00	
(6 man crew at $1,680.00 a day for: 30 days)		
Payroll Tax & Overheads:	$66,951.36	
Preliminary Engineering:	$19,998.74	
Construction Supervision:	$14,227.92	
Labor Total:		$151,578.02
	Project Cost:	$400,017.08
	Scrap / Salvage Credit:	$0.00
	Project Total:	**$400,017.00**

Estimated on: 18-Dec-13
Estimated by: bf2cc

Estimate valid for 1 year from date of estimate

Norfolk Southern Railway

Highway Crossing Signalization Program - Material List

Do not substitute items without permission from S & E Engineering

City:	HARVEL
Road:	24TH AVE
Mile Post:	D-422.78
Drawing Number:	BKDS42278
State ProjectNumber:	
County:	MONTGOMERY
A A R Number:	480031W
Project Number:	04.0998
File Number:	
New File Number:	CX-TBA
WBS:	F-01200
Store Number:	
Supervisor:	W.D. HAUCK
Tax Code:	

Vendor to supply the following copies after pricing:

1 Set - Material Management with original Invoice
2 Sets - with plans shipped in car with material
1 Set - S&EGen. Supt. Construction w/copy of invoice

Location: HARVEL IL S&E Proj. No.: 04.0998 AFE No.: F-01200 Drawing No.: BKDS42278

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Railroad Signal Design

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
3	670-360693-4	EA	$5.55	$16.65	AAR/DOT NUMBER PLATE/DECAL, ORDER 3 PER PROJECT. 60 DAY LEAD TIME. SUPPLIED BY S'TRAN.						
1	165-006505-4	EA	$1,075.23	$1,075.23	AC SERVICE, COMPLETE LESS METER BASE, ASSEMBLED ON 30' POLE						
6	670-119241-4	EA	$25.01	$150.06	ARRESTOR, LIGHTNING HEAVY DUTY CLEAR VIEW SAFETRAN 022585-1X						
29	105-002620-4	EA	$302.42	$8,770.18	BATTERY, NICAD 340AH, MODEL SPL340						
1	670-503047-4	EA	$183.15	$183.15	BELL, CROSSING ELECTRONIC GENERL SIGNAL, EB-3-360-5 CR 02-044350						
2	670-980689-4	EA	$75.48	$150.96	BRACKET HIGH WIND, (RIGID 3'), WIG- 191036, WALRUS TUSK TYPE						
2	670-561375-4	EA	$1,208.79	$2,417.58	BRACKET, GATE SAVER, NEG385102GS, SPRING LOADED SWING AWAY ADAPTER FOR FIBERGLASS/ALUMINUM GATES, USE WITH GATE 38' AND LESS						
2	670-356949-4	EA	$94.05	$188.10	CABLE, 10' GENERATOR HOOK UP, SERRMI P/N 40524. FEMALE CONNECTOR						
500	465-939422-4	LF	$2.93	$1,465.00	CABLE, UG 12 CONDUCTOR NO 14 AWG SOLID EACH CONDUCTOR WITH 5/64 IN INSULATION 10 MIL						
6500	465-292862-4	LF	$1.36	$8,840.00	CABLE, UG 2-6 TWISTED, S-23 OKONITE 113-12-3933 SOLID TINNED CONDUCTOR						
500	465-292929-4	LF	$4.13	$2,065.00	CABLE, UG 5 COND. NO. 6 AWG SOLID COPPER CABLE TO MEET NS CORP. SPEC. FOR SIGNAL						
2850	465-292945-4	LF	$1.63	$4,645.50	CABLE, UG 5-14, S-54 OKONITE 206-14-6885						
3200	465-791835-4	FT	$3.55	$11,360.00	CABLE, UG AC ENTRANCE 3C#6-7X OKONITE FMPF-L 094-078 TR W/G 1 X 8 7X W010 BRZ TAPE 600V PRODUCT CODE 206-11-6070						
1	670-128745-4	EA	$162.75	$162.75	CHOKE, BATTERY SAFETRAN NO 8A065A FOR GRADE CROSSING PREDICTOR						
120	165-544477-4	FT	$3.22	$386.40	CONDUIT, 4"x10' PVC, SCHEDULE 80 BELL CONNECTOR AT ONE END, 1/2 PT. GLUE IN KIT 670-123298-4						

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

Location: HARVEL IL S&E Proj. No.: 04.0998 AFE No.: F-01200 Drawing No.: BKDS42278

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Railroad Signal Design

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
19	670-664917-4	EA	$90.11	$1,712.09	CONNECTOR KIT, WELDED FAR RAIL, CONSISTING OF RUBBER HOSE PROPERLY DRILLED, BONDSTRAND, 1 SPLICING SLEEVE, 1 REDUCING SLEEVE, 3 CLAMPS, 1 TRACK CLIP, 1 WEB WELDED TRACK CONNECTOR, 1 WELD METAL, SAFETRAN 111359-2X						
19	670-632520-4	EA	$77.63	$1,474.97	CONNECTOR KIT, WELDED NEAR RAIL, CONSISTING OF, RUBBER HOSE PROPERLY DRILLED, BONDSTRAND, SPLICING SLEEVE, 1 REDUCING SLEEVE, 5 CLAMPS, 1 TRACK CLIP, 1 WEB WELDED TRACK CONNECTOR, 1 WELD METAL, SAFETRAN 111359-1X						
2	670-793404-4	EA	$1,159.00	$2,318.00	COUNTERWEIGHT PKAGE, 17-24'GATE S'TRAN S- MECH ONLY, STAINLESS, TO INCLUDE HUB, SUPPORT ARMS						
1	670-393315-4	EA	$808.29	$808.29	COUPLER, BIDIRECTIONAL SIMULATION S'TRAN# 62664-525						
4	670-760012-4	EA	$44.32	$177.28	COVER, FOR 1 WAY FLASHING LIGHT ASSY. 18 OZ. BLACK VINYL COATED NYLON. ====TO COVER 2 LAMPS====						
1	670-986650-4	EA	$354.27	$354.27	DISPOSAL, CONSTRUCTION DEBRIS AND CLEANING X'ING EQUIPMENT CONTAINER						
1	670-000004-4	EA	$700.00	$700.00	FCC LICENSE FOR MONITOR/RADIO						
2	670-000003-4	EA	$255.85	$511.70	FILL/STONE #57, QUANITY IS BASED ON TRUCK LOAD PLUS DELIVERY COST						
1	670-012732-4	EA	$359.64	$359.64	FILTER, ELECTRO CODE 211HZ REJECTION PART# TF-211						
2	670-015231-4	EA	$599.40	$1,198.80	FOUNDATION, DIXIE,S-2 GATE 2'6"X2'6"X5'6" ASSEMBLED						
2	670-005377-4	EA	$338.00	$676.00	GATE ARM, (FOR LEDS) ALUMINUM, 17-24 FT, ARM ASSEMBLY, INCLUDES GATE GUARD FOR GATE LIGHT CABLE. HIGH INTENSITY VERTICAL STRIPES.						
1	670-696894-4	EA	$34,574.48	$34,574.48	GCP4000 - 2 TRK (2TC) - REDUNDANT - 40/40 AMP WIRED RACK EQUIP. FOR 6X8 XING SHELTER, (INCL. 2 TRK CHASSIS A80465, 4 TRK MODS. A80418, 2-SSCC A80405, 2 CPU A80403, 1 SEAR A80410, 1 DISPLAY A80407, , 2-40 AMP CHARGERS) IPN: 003131-4X						
1	670-687087-4	EA	$21,483.70	$21,483.70	GCP4000 - 2 TRK (5TC) - NON-REDUNDANT - 40 AMP WIRED RACK EQUIP. FOR 6X8 REMOTE SHELTER, (INCL. 5 TRK CHASSIS A80440, 2 TRK MODS. A80418, 0 SSCC, 1 CPU A80403, NO SEAR, 1 DISPLAY A80407, 1-40 AMP CHARGER) IPN: 003131-3X						

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

Location: HARVEL IL S&E Proj. No.: 04.0998 AFE No.: F-01200 Drawing No.: BKDS42278

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Railroad Signal Design

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
3	670-396564-4	EA	$3,430.68	$10,292.04	GCP4000 - MODULE - TRACK MODULE - IPN: A80418						
1	670-011479-4	EA	$956.00	$956.00	GUARD, SIGNAL ARMCO LINER PLATE CIRCULAR 8'DIA., 10 GA.GALVANIZD STEEL WITH (6) 5'9" GALVANIZED						
2	670-477991-4	EA	$410.00	$820.00	KIT, GROUNDING ASSY FOR AL I/S INCLUDES 8 GRD RDS,200'#4WIRE,12 4 WIRE ONE-SHOTS. ERICO SBK206						
1	670-123298-4	EA	$345.97	$345.97	KIT, HARDWARE SUPPLIES REQUIRED X'ING P'CKAGES. WEB CONNECTORS FOR SHUNT(8EA) TAPE, AMPS,P'GUM PAINT,SLEEVES,TAGS,GLUE, 100 EA WHITE TAGS,)NE CAN BLUE MARKING PAINT ETC…						
2	670-092155-4	EA	$160.00	$320.00	LAMP ASSY, LED GATE ARM KIT (INCLUDES 3 LAMPS COMPLETE WITH CABLES AND MTG. HARDWARE) REC #: 9298-1120						
2	670-005058-4	EA	$1,786.08	$3,572.16	LAMP ASSY, LED, 5” MAST BACK TO BACK LIGHTS (IPN: 042003-L487XNS)						
6	670-440826-4	EA	$1.90	$11.40	LINK, SAFETRAN 024620-1X INSL TESTING COMP 1 IN CENTER SIGNAL CIRCUITS CR 02-286662						
4	255-590880-4	EA	$17.52	$70.08	LOCK, AMERICAN LOCK MODEL H-10KA KEYED ALIKE TO PRIVATE KEYWAY D456 AND STAMPED "NS SIG"						
2	670-637778-4	EA	$1,325.00	$2,650.00	MAST, 5" ALUMINUM 13'10" WITH DOUBLE JCT. BOX BASE. S'TRAN P# 070519-11AX.						
2	670-875060-4	EA	$2,596.32	$5,192.64	MECHANISM, GATE MODEL S-60, WITH DEFROSTER , WITHOUT MINI TRACKSIDE SENSOR S'TRAN # 0740007-X002A3						
1	670-000001-4	EA	$726.23	$726.23	MISC. EXPENSE, MATERAIL/FILL						
1	670-000007-4	EA	$307.02	$307.02	MISC. EXPENSE, TRACK WORK (I.E. INS JTS, RODS, ETC.)						
2	000-000000-4	EA	$5,000.00	$10,000.00	MISC. EXPENSE, UNDERGROUND BORING						
4	670-001347-4	EA	$59.67	$238.68	PACKAGE, HARDWARE SIGN 5 IN. MOUNTING, SERRMI A1250-5, HARMON @200965-000, OR						
11	670-004475-4	EA	$336.93	$3,706.23	PACKAGE, KIT FOR ADDITIONAL TRACK CONNECTION CROSSING LOCATION. INCLUDES ALL EQUIPMENT, WIRING AND SHOP LABOR. (1 PER WIRE PAIR) IPN: 051000-NSX-0005						
1	255-646807-4	EA	$31.19	$31.19	PADLOCK, SAFETRAN PART NO. 030399-29X SCREW TYPE FOR CIR CONTROLLER AND BTY. BOX						

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

Location: HARVEL IL S&E Proj. No.: 04.0998 AFE No.: F-01200 Drawing No.: BKDS42278

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Railroad Signal Design

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
1	670-514605-4	EA	$11.11	$11.11	PINNACLE, W-C SECT 1-11, 4"& 5" REF K1 110-8 OR SAFETRAN NO. @035045-503X						
3	670-259211-4	EA	$47.25	$141.75	PLUG BOARD KIT, TYPE B-1 & VOLTAGE TEST TERMINAL, SAFETRAN 420000-75X						
2	165-902002-4	EA	$303.43	$606.86	PROTECTOR, SURGE 120/240VAC, ERICO P/N EPD120/240TDFL						
8	465-002899-4	EA	$22.24	$177.92	REEL, CABLE DISPOSABLE FOR CROSSING SIGNAL PACKAGES						
3	670-742096-4	EA	$43.68	$131.04	RELAY INTERFACE PROBE, ULTRATECH PN 16031-00						
3	670-456936-4	EA	$145.69	$437.07	RELAY RACK, SWING, FARADAY SHELTER FOR ONE RELAY, SSFETRAN P/N T15331						
3	670-707995-4	EA	$510.12	$1,530.36	RELAY, TYPE B1, NEV LINE, 900 OHMS,.008 AMPERES GRS A62-308 OR SAFETRAN @400003						
4	435-805560-4	EA	$2.78	$11.12	SAND, 25LB BAG FOR CABLE ENTRANCE INTO THE SHELTER						
1	670-113448-4	EA	$910.23	$910.23	SEARIIi, (VHFC w/ANTENNA) - VHF COMMUNICATOR, SAFETRAN P/N A80276, 1/ PER CROSSING						
2	670-749325-4	EA	$237.18	$474.36	SHELF, FOLDING, FOR LAPTOP USE IN FARADAY 6X8 SHELTER, SAFETRAN 052852-128X						
2	670-755523-4	EA	$9,744.79	$19,489.58	SHELTER, 6'X8' ALUMN FARADAY W/1EA EQUIPMENT RACK, W/CABLE CHUTES BEHIND TERMINAL BOARD, W/GEN RECEPTICAL, BREAKER BOX GFI OUTLET FOR LAPTOP SHELF SAFETRAN 058400-68-85						
2	670-471572-4	EA	$3.48	$6.96	SHIELD, GROUND SERRMI P/N 61278 FOR GROUNDING A RH 4 POST TERMINAL BLOCK DIRECTLY TO FARADAY SHIELD						
2	670-472200-4	EA	$3.48	$6.96	SHIELD, GROUND SERRMI PART NO. 61278 FOR GROUNDING A LH 4 POST TERMINAL BLOCK DIRECTLY TO FARADAY SHIELD						
2	670-586967-4	EA	$42.98	$85.96	SHUNT COVER W/LAG SCREWS, 19"X19", SERRMI #40271, ORDER 1 PER SHUNT						
4	670-652773-4	EA	$460.98	$1,843.92	SHUNT, MULTI-FREQ. #62775-1543 SAFETRAN NARROW BAND						
6	670-688850-4	EA	$369.89	$2,219.34	SHUNT, MULTI-FREQ. #62775-3497 SAFETRAN NARROW BAND						
2	670-393331-4	EA	$37.43	$74.86	SIGN CROSSING MALFUNCTION ASSEMBLY FOR 4" AND 5" MAST, SAFETRAN #T17215						

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

Location: HARVEL IL S&E Proj. No.: 04.0998 AFE No.: F-01200 Drawing No.: BKDS42278

Store No.: P.O.Number: Date Required: Date Shipped: Vendor: Railroad Signal Design

Qty.	Class-Item-CD	UI	Price per Item	Total Price	Item Description	Quantity Shipped	Quantity Installed Date Quan.	Date Quan.	Date Quan.	Quantity Returned (Credit)	Special Instructions
2	670-554843-4	EA	$77.05	$154.10	SIGN, 2 TRACK SIGN, HIGH INTENSITY, SAFETRAN #035207-2HX						
2	670-016346-4	EA	$143.23	$286.46	SIGN, X-BUCK, HI-INTENSIVE REFLECTIVE FRT. & BACK FOR ALL STATES, SAFETRAN# 035200-91X						
1	670-330382-4	RL	$18.06	$18.06	TAPE, THOR 3" DURATEC, ORANGE 1000' LENGTHS. "WARNING STOP DIGGING"						
15	670-478560-4	EA	$20.56	$308.40	TERMINAL BLOCK, ERICO 4 POST P/N B2700A2C1WH W/HARDWARE LESS LIGHTNING ARRESTOR						
3	610-065626-4	EA	$18.18	$54.54	ULTRA-TECH 15206-01 CONNECTIVITY BLOCK FOR GRS B1 RELAY						
3	670-007238-4	EA	$117.04	$351.12	UNIT, THE INSTALLATION AND WIRING OF A DEVICE WHICH REQUIRE A MINIMUM OF FOUR WIRE CONNECT-						
2	450-986008-4	EA	$30.45	$60.90	WRENCH, TEST POST TYPE B DWG 55393-3, GR.1						

Total Material: $176,858.40

APPROVED BY STATE	APPROVED BY RAILROAD	CAR NUMBER	SEAL NUMBER

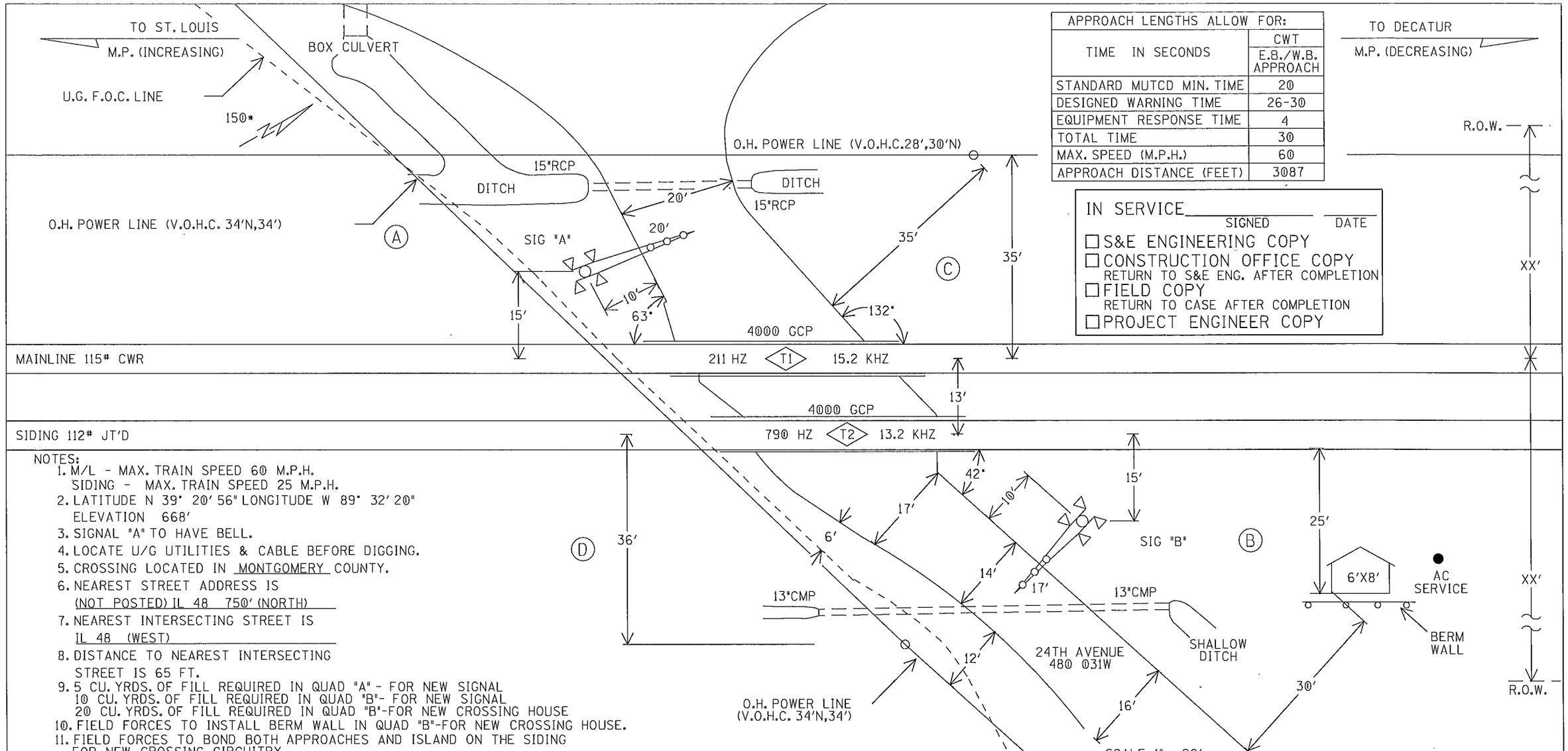
SH. NO.	CONTENTS
NX1	INDEX SHEET
1	LAYOUT
2	PROFILE
3	CABLE PLAN
4	LOAD CENTER
5	B12 & B16 CHARGERS & BATTERIES
6	4000 GCP 2-TK CHASSIS & MODULE LAYOUT
7	4000 GCP PROGRAMMING SETUP
8	4000 GCP PROGRAMMING SETUP
9	CONNECTORS FOR TRACK MODULES
10	CPU MODULE, SEAR III & VHF HOOK-UPS
11	SEAR III PROGRAMMING SETUP
12	SSCC#1 MODULE HOOK-UP
13	SSCC#2 MODULE HOOK-UP
14	SIGNAL "A" S60 GATE & FLASHER CIRCUITS
15	SIGNAL "B" S60 GATE & FLASHER CIRCUITS
16	BACKBOARD 1A & 1B
17	REAR BACKBOARD 1A & 1B
18	FARADAY SHIELD 1A & 1B
19	FARADAY SHIELD 1C
20	HOUSE SIDE C LAYOUT & RACK PLACEMENT
21	HOUSE SIDE A LAYOUT
22	HOUSE SIDE B LAYOUT & TOP VIEW

INDEX SHEET

DESIGNED BY: TAH 11-15-13	NORFOLK SOUTHERN		
DRAWN BY: RSD 11-15-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	D-422.78
CHECKED BY: RRD 11-15-13	HARVEL, IL FLGS AT 24TH AVE.		
IN SERVICE: - -	BROOKLYN	FILE No.	R-
	CADD or DWG. No. BKDS42278.NX1	SHEET No.	1 of 1

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



APPROACH LENGTHS ALLOW FOR:	
TIME IN SECONDS	CWT E.B./W.B. APPROACH
STANDARD MUTCD MIN. TIME	20
DESIGNED WARNING TIME	26-30
EQUIPMENT RESPONSE TIME	4
TOTAL TIME	30
MAX. SPEED (M.P.H.)	60
APPROACH DISTANCE (FEET)	3087

IN SERVICE_____ SIGNED _____ DATE

- ☐ S&E ENGINEERING COPY
- ☐ CONSTRUCTION OFFICE COPY
  RETURN TO S&E ENG. AFTER COMPLETION
- ☐ FIELD COPY
  RETURN TO CASE AFTER COMPLETION
- ☐ PROJECT ENGINEER COPY

NOTES:

1. M/L - MAX. TRAIN SPEED 60 M.P.H.
   SIDING - MAX. TRAIN SPEED 25 M.P.H.
2. LATITUDE N 39° 20' 56" LONGITUDE W 89° 32' 20"
   ELEVATION 668'
3. SIGNAL "A" TO HAVE BELL.
4. LOCATE U/G UTILITIES & CABLE BEFORE DIGGING.
5. CROSSING LOCATED IN MONTGOMERY COUNTY.
6. NEAREST STREET ADDRESS IS
   (NOT POSTED) IL 48 750' (NORTH)
7. NEAREST INTERSECTING STREET IS
   IL 48 (WEST)
8. DISTANCE TO NEAREST INTERSECTING
   STREET IS 65 FT.
9. 5 CU. YRDS. OF FILL REQUIRED IN QUAD "A" - FOR NEW SIGNAL
   10 CU. YRDS. OF FILL REQUIRED IN QUAD "B"- FOR NEW SIGNAL
   20 CU. YRDS. OF FILL REQUIRED IN QUAD "B"-FOR NEW CROSSING HOUSE
10. FIELD FORCES TO INSTALL BERM WALL IN QUAD "B"-FOR NEW CROSSING HOUSE.
11. FIELD FORCES TO BOND BOTH APPROACHES AND ISLAND ON THE SIDING
    FOR NEW CROSSING CIRCUITRY.
12. UTILITIES IN THE AREA - CONTACT:
    POWER-AMEREN IP (877) 857-5571
    PHONE-IL CONSOLIDATED TELE. (217) 235-3311
13. ADDITIONAL SPANS MAY NEED TO BE CONSTRUCTED BY
    POWER COMPANY TO OBTAIN AC AT THIS LOCATION.

(A)(B)(C)(D) = QUADRANT MARKERS

14. FIELD FORCES TO REMOVE FOULING AND INSTALL NEW
    TRACK CIRCUIT AT SWITCH LOCATED 2294'
    NORTH OF CROSSING - SEE DWG#BKDS42234 (CP HARVEL)
    U.G. F.O.C. LINE
15. FIELD FORCES TO INSTALL 211HZ TRACK FILTER
    AT SIGNALS LOCATED 1906' NORTH OF CROSSING.

SCALE: 1" = 20'
PROJECT #04.0998

LAYOUT

FILE No. CX

DESIGNED BY:	
TAH	11-15-13
DRAWN BY:	
RSD	11-15-13
CHECKED BY:	
RRD	11-15-13
IN SERVICE:	
	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.

M.P.: D-422.78

HARVEL, IL
FLGS AT 24TH AVE.

BROOKLYN

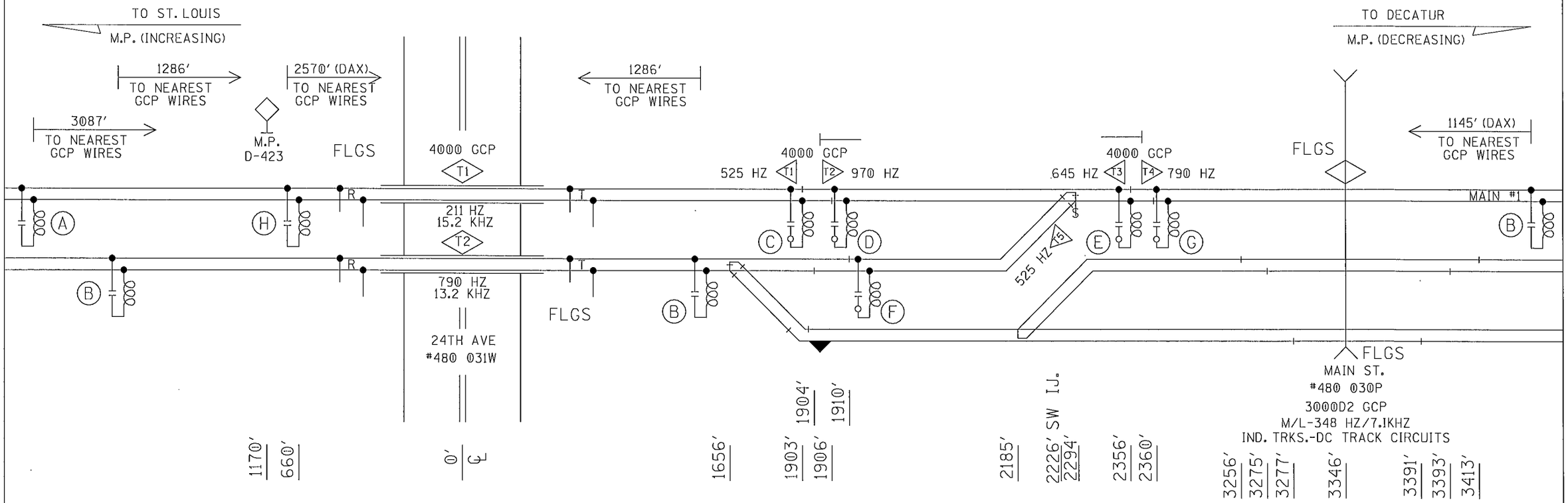
FILE No. R-

CADD or DWG. No. BKDS42278.01

SHEET No. 1 of 22

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



Ⓐ- MF-NBS 62775-1543 (211HZ)

Ⓑ- MF-NBS 62775-3497 (790HZ)

Ⓒ- MF-NBS 62775-1543 (211HZ) 8V617 1200' D.L.

Ⓓ- MF-NBS 62775-3497 (645HZ) 8V617 600' D.L.

Ⓔ- MF-NBS 62775-3497 (970HZ) 8V617 600' D.L.

Ⓕ- MF-NBS 62775-3497 (525HZ) 8V617 800' D.L.

Ⓖ- NBS 62775-348HZ W/D.L.

Ⓗ- MF-NBS 62775-3497 (525HZ)

PROFILE

DESIGNED BY: TAH	11-15-13
DRAWN BY: RSD	11-15-13
CHECKED BY: RRD	11-15-13
IN SERVICE:	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: D-422.78

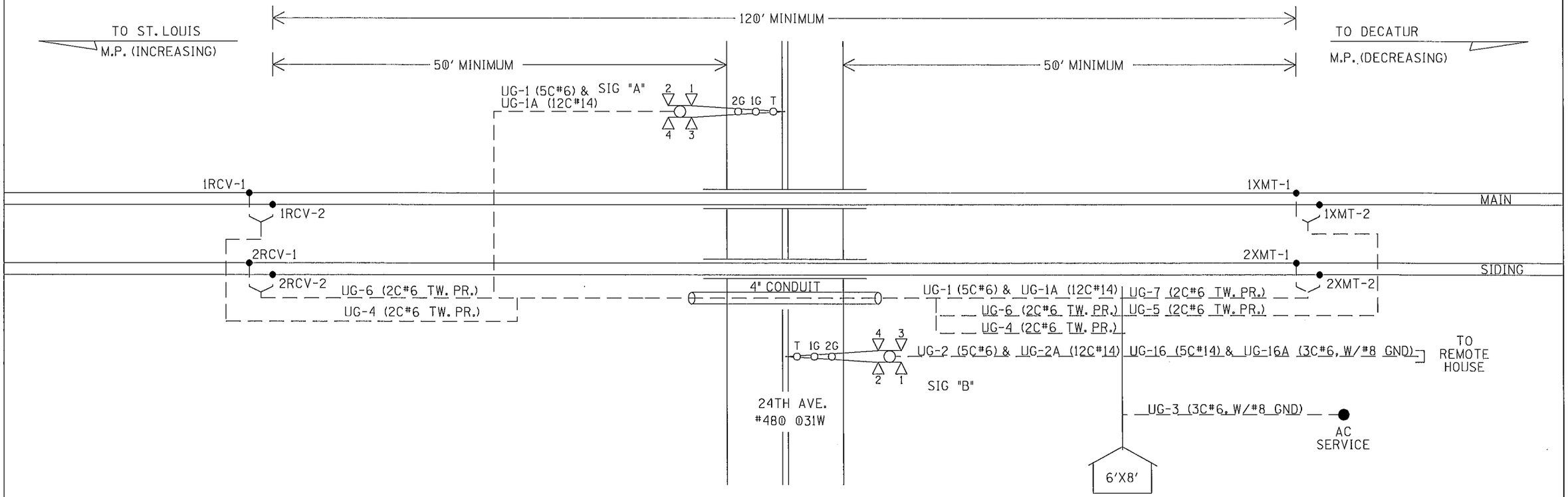
HARVEL, IL
FLGS AT 24TH AVE.

BROOKLYN FILE No. R-

CADD or DWG. No. BKDS42278.02 SHEET No. 2 of 22

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



UG-1-5CUG #6
AEC
AEZ
AEB
B16-A
N16-A

UG-2-5CUG #6
BEC
BEZ
BEB
B16-B
N16-B

UG-1A-12CUG #14
NAXG
AXG
1AXX
AXX
XGP1
AGD
AGBX120
AGNX120
SPARE
SPARE
SPARE
SPARE

UG-2A-12CUG #14
NBXG
BXG
1BXX
BXX
XGP1
XGP
BGD
BGBX120
BGNX120
SPARE
SPARE
SPARE

UG-3-3CUG #6 W/#8 GND
BX120-A
BX120-B
NX120
GND

UG-4-TW. PR. #6
1RCV-1
1RCV-2

UG-5-TW. PR. #6
1XMT-1
1XMT-2

UG-6-TW. PR. #6
2RCV-1
2RCV-2

UG-7-TW. PR. #6
2XMT-1
2XMT-2

UG-16A-3CUG #6 W/#8 GND
BX120-A
BX120-B
NX120
GND

UG-16-5CUG #14
24-DAX
N24-DAX
SPARE
SPARE
SPARE

CABLE PLAN

DESIGNED BY:	
TAH	11-15-13
DRAWN BY:	
RSD	11-15-13
CHECKED BY:	
RRD	11-15-13
IN SERVICE:	
	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. | M.P.: D-422.78

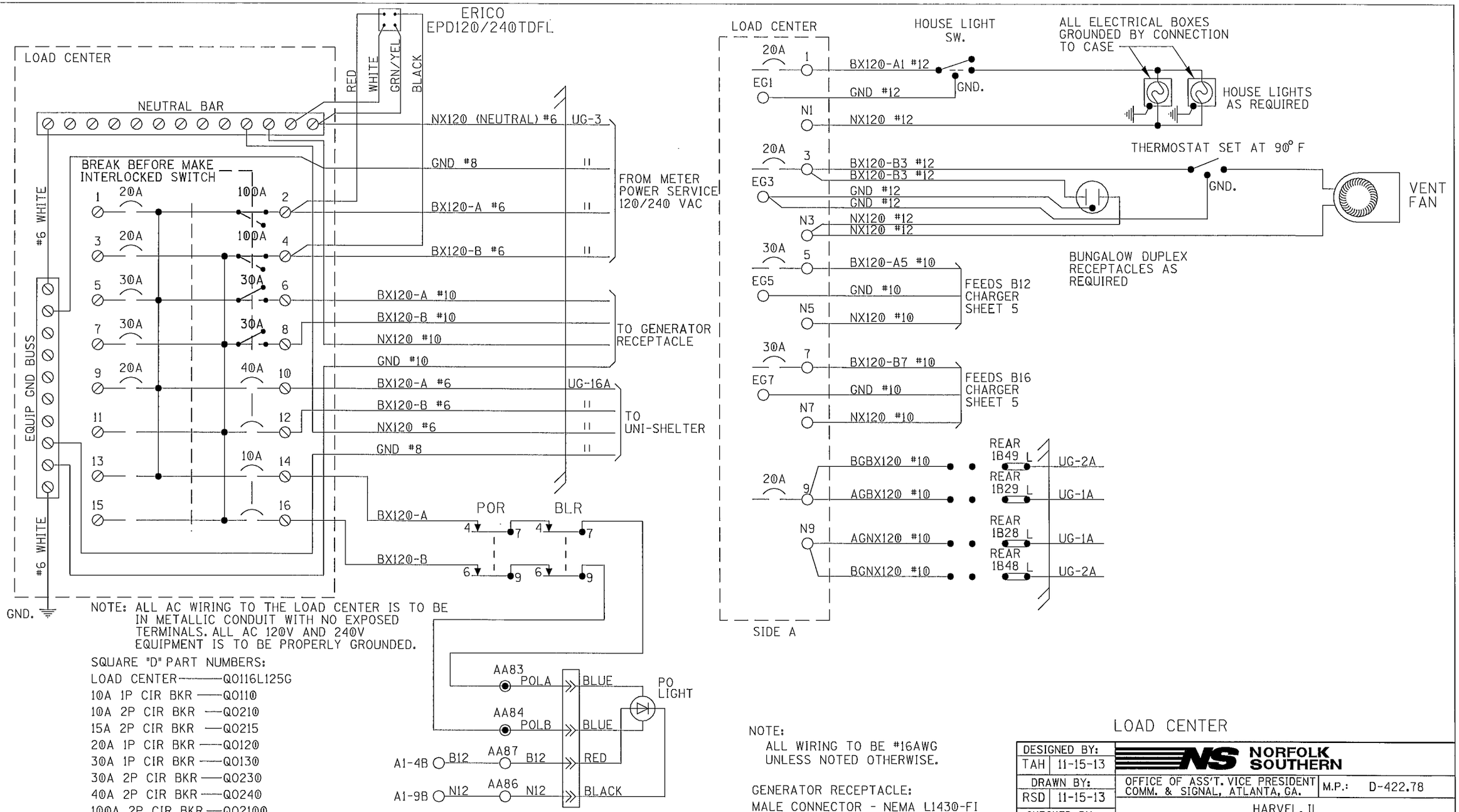
HARVEL, IL
FLGS AT 24TH AVE.

BROOKLYN | FILE No. R-

CADD or DWG. No. BKDS42278.03 | SHEET No. 3 of 22

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



NOTE: ALL AC WIRING TO THE LOAD CENTER IS TO BE IN METALLIC CONDUIT WITH NO EXPOSED TERMINALS. ALL AC 120V AND 240V EQUIPMENT IS TO BE PROPERLY GROUNDED.

SQUARE "D" PART NUMBERS:

LOAD CENTER	QO116L125G
10A 1P CIR BKR	QO110
10A 2P CIR BKR	QO210
15A 2P CIR BKR	QO215
20A 1P CIR BKR	QO120
30A 1P CIR BKR	QO130
30A 2P CIR BKR	QO230
40A 2P CIR BKR	QO240
100A 2P CIR BKR	QO2100
MECH INTERLOCK	PK4DTIM4LA

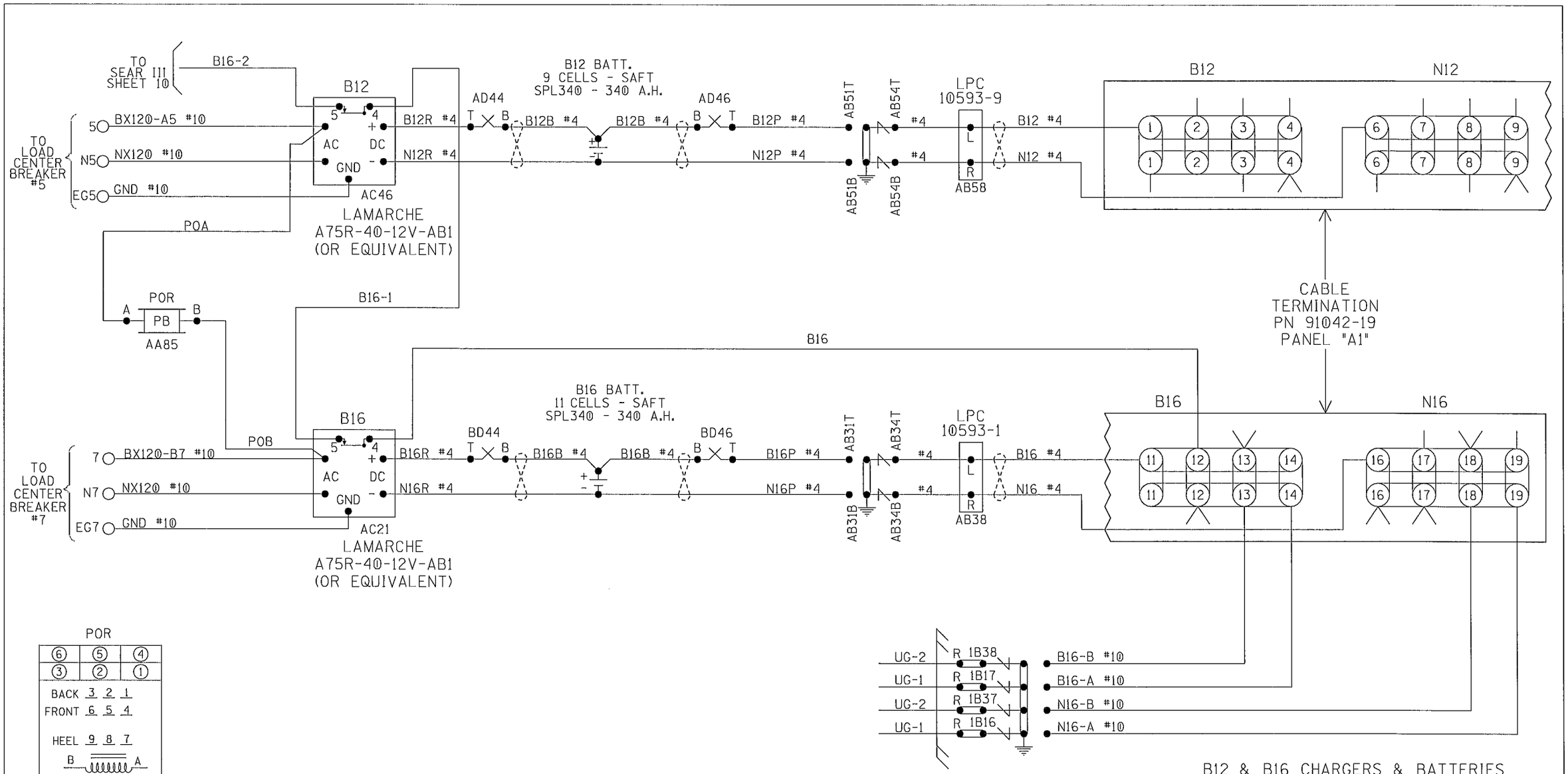
NOTE:
ALL WIRING TO BE #16AWG
UNLESS NOTED OTHERWISE.

GENERATOR RECEPTACLE:
MALE CONNECTOR - NEMA L1430-FI

LOAD CENTER

DESIGNED BY: TAH 11-15-13	NORFOLK SOUTHERN		
DRAWN BY: RSD 11-15-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.:	D-422.78
CHECKED BY: RRD 11-15-13	HARVEL, IL FLGS AT 24TH AVE.		
IN SERVICE: - -	BROOKLYN	FILE No.	R-
	CADD or DWG. No. BKDS42278.04	SHEET No.	4 of 22

| REVISION INITIALS | | |



POR

6	5	4
3	2	1

BACK 3 2 1
FRONT 6 5 4

HEEL 9 8 7

B A

POTTER BRUMFIELD
RELAY
(FRONT VIEW)
KUP-14A15-240

B		A
9	8	7

NOTES:
ALL WIRING TO BE #16AWG
UNLESS NOTED OTHERWISE.

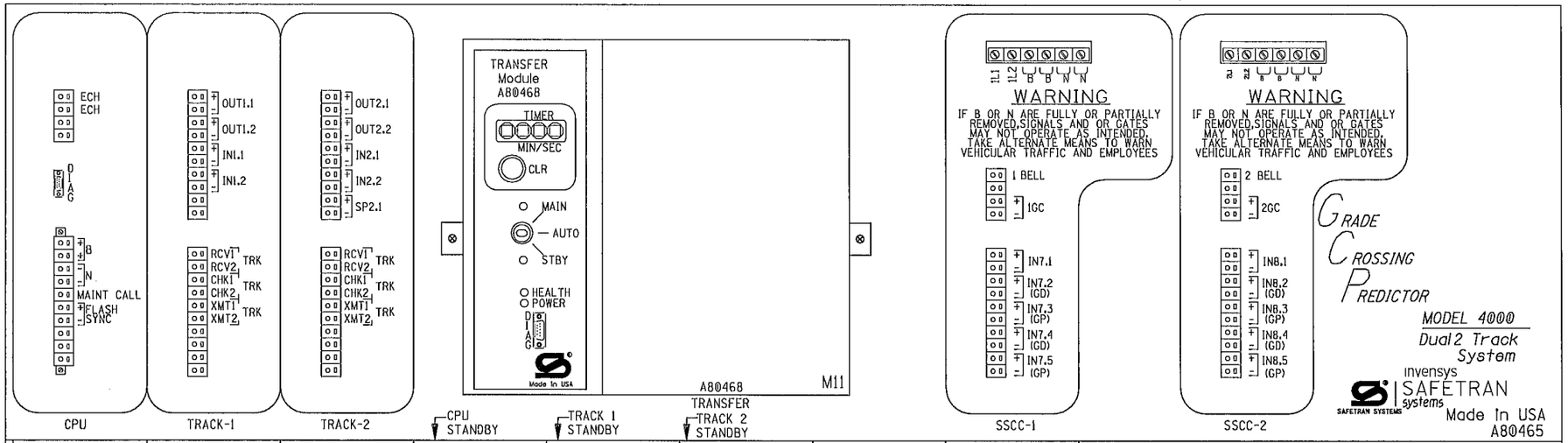
= TWIST

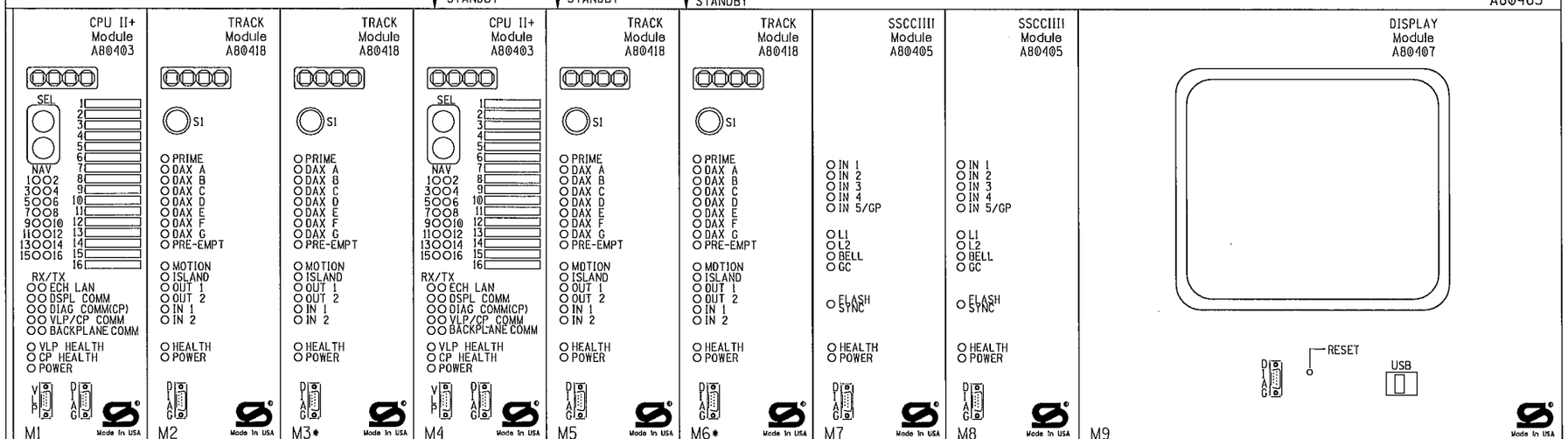
B12 & B16 CHARGERS & BATTERIES

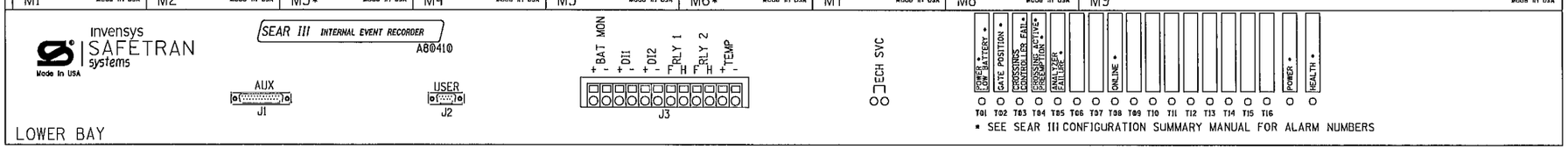
DESIGNED BY: TAH 11-15-13	NORFOLK SOUTHERN
DRAWN BY: RSD 11-15-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: D-422.78
CHECKED BY: RRD 11-15-13	HARVEL, IL FLGS AT 24TH AVE.
IN SERVICE: - -	BROOKLYN — FILE No. R-
	CADD or DWG. No. BKDS42278.05 — SHEET No. 5 of 22

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.







WARNING

REMOVAL OF THE SSCCIIII MODULE WILL CAUSE THE GATE(S) TO DROP BUT THE LIGHTS WILL NOT ACTIVATE

CAUTION

ASSURE CORRECT POLARITY OF THE SSCCIIII MODULE OR SEVERE DAMAGE WILL OCCUR.

ATTENTION!

ENSURE THE DISPLAY MODULE HEATER IS DISABLED. LEAVING THE DISPLAY HEATER ENABLED WILL REDUCE THE AMOUNT OF BATTERY STANDBY TIME IN THE EVENT OF AN AC POWER FAILURE.

HEATER FUNCTION IS JUMPER SELECTABLE ON THE DISPLAY MODULE BOARD.
THREE OPTIONS ARE AVAILABLE:
NORMAL LCD HTR (DEFAULT)
HI CURRENT
NO JUMPER (HEATER DISABLED)

*= MAIN AND STANDBY MAY USE RIO IN TRACK 2 SLOTS (M3 AND M6)

4000 GCP 2-TK CHASSIS & MODULE LAYOUT

DESIGNED BY: TAH 11-15-13	NORFOLK SOUTHERN
DRAWN BY: RSD 11-15-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: D-422.78
CHECKED BY: RRD 11-15-13	HARVEL, IL FLGS AT 24TH AVE.
IN SERVICE: - -	BROOKLYN — FILE No. R-
REVISION INITIALS	PROPERTY NORFOLK SOUTHERN RAILWAY CO. — CADD or DWG. No. BKDS42278.06 — SHEET No. 6 of 22

Program Report

Location and SIN

DOT Number: 480031W
Milepost Number: D-422.78
Site Name: 24TH AVE

SIN: 755053403016

MCF and Template Selection

MCF Name: GCP-T6X-02-1.mcf
MCF Revision: 021
MCFCRC: 6076E435

Template = 1A:6 Trk Bi

Check Numbers

Office Check No. (DT 4.6.0): 1C3D5D47
Office Check Number: 1C3D5D47
Config. Check Number: 652A7312
(Based on MCF Revision 021)

Program

BASIC: module configuration
Track 1 Slot = Track
Track 2/RIO 1 Slot = Track
Track 3 Slot = Not Used
Track 4 Slot = Not Used
Track 5/RIO 2 Slot = Not Used
Track 6/RIO 3 Slot = Not Used
SSCC-1 Slot = SSCC31
SSCC-2 Slot = SSCC31
SEAR Used = Yes

BASIC: MS/GCP operation
Track 1 : MS/GCP Operation = Yes
Track 2 : MS/GCP Operation = Yes

BASIC: Island operation
Track 1 : Island Used = Internal
Track 2 : Island Used = Internal

BASIC: preemption
Preempt Logic = No

BASIC: radio Dax links
Radio DAX link A Used = No
Radio DAX link B Used = No

BASIC: Vital Comms links
Vital Comms link 1 Used = No
Vital Comms link 2 Used = No

PREDICTORS: track 1
Track 1 : Prime Used = Yes
Track 1 : Dax A Used = No
Track 1 : Dax B Used = No
Track 1 : Dax C Used = No
Track 1 : Dax D Used = No
Track 1 : Dax E Used = No
Track 1 : Dax F Used = No
Track 1 : Dax G Used = No

PREDICTORS: track 2
Track 2 : Prime Used = Yes
Track 2 : Dax A Used = No
Track 2 : Dax B Used = No
Track 2 : Dax C Used = No
Track 2 : Dax D Used = No
Track 2 : Dax E Used = No
Track 2 : Dax F Used = No
Track 2 : Dax G Used = No

GCP: track 1
Track 1 : GCP Freq Category = Standard
Track 1 : GCP Frequency = 211 Hz
Track 1 : Approach Distance = 3087 ft
Track 1 : Uni/Bi/Sim-Bidirnl = Bidirnl
Track 1 : GCP Transmit Level = High
Track 1 : Island Connection = Isl1
Track 1 : Island Distance = 134 ft
Track 1 : Computed Distance = 9999 ft
Track 1 : Linearization Steps = 100

GCP: track 1 enhanced det
Track 1 : Inbound PS Sensitivity = Off
Track 1 : Speed Limiting Used = Yes
Track 1 : Outbound False Act Lvl = Normal
Track 1 : Outbound PS Timer = 20 sec
Track 1 : Trailing Switch Logic = Off
Track 1 : Post Joint Detn Time = 15 sec
Track 1 : Adv Appr Predn = No
Track 1 : CancelPickup Delay = This Isl

GCP: track 1 prime
Track 1 : Prime Warning Time = 30 sec
Track 1 : Prime Offset Distance = 0 ft
Track 1 : Switch MS EZ Level = 65
Track 1 : Prime MS/GCP Mode = Pred
Track 1 : Prime Pickup Delay = 15 sec
Track 1 : Prime UAX = IP
Track 1 : Prime UAX Pickup = 25 sec

GCP: track 1 pos start
Track 1 : Positive Start = Off
Track 1 : Sudden Shnt Det Used = No
Track 1 : Low EZ Detection Used = No

GCP: track 1 MS Control
Track 1 : MS/GCP CtrlIP Used = No
Track 1 : MS Sensitivity Level = 0
Track 1 : Compensation Level = 1300
Track 1 : Warn Time-Ballast Comp = High
Track 1 : Low EX Adjustment = 39
Track 1 : Bidirn Dax Passthru = No
Track 1 : False Act on Train Stop = No
Track 1 : EX Limiting Used = Yes
Track 1 : EZ Correction Used = Yes

GCP: track 2
Track 2 : GCP Freq Category = Standard
Track 2 : GCP Frequency = 790 Hz
Track 2 : Approach Distance = 1286 ft
Track 2 : Uni/Bi/Sim-Bidirnl = Bidirnl
Track 2 : GCP Transmit Level = Medium
Track 2 : Island Connection = Isl2
Track 2 : Island Distance = 132 ft
Track 2 : Computed Distance = 9999 ft
Track 2 : Linearization Steps = 100

GCP: track 2 enhanced det
Track 2 : Inbound PS Sensitivity = Off
Track 2 : Speed Limiting Used = Yes
Track 2 : Outbound False Act Lvl = Normal
Track 2 : Outbound PS Timer = 20 sec
Track 2 : Trailing Switch Logic = Off
Track 2 : Post Joint Detn Time = 15 sec
Track 2 : Adv Appr Predn = No
Track 2 : CancelPickup Delay = This Isl

GCP: track 2 prime
Track 2 : Prime Warning Time = 30 sec
Track 2 : Prime Offset Distance = 0 ft
Track 2 : Switch MS EZ Level = 10
Track 2 : Prime MS/GCP Mode = Pred
Track 2 : Prime Pickup Delay = 15 sec
Track 2 : Prime UAX = Not Used

GCP: track 2 pos start
Track 2 : Positive Start = Off
Track 2 : Sudden Shnt Det Used = No
Track 2 : Low EZ Detection Used = No

GCP: track 2 MS Control
Track 2 : MS/GCP CtrlIP Used = No
Track 2 : MS Sensitivity Level = 0
Track 2 : Compensation Level = 1300
Track 2 : Warn Time-Ballast Comp = High
Track 2 : Low EX Adjustment = 39
Track 2 : Bidirn Dax Passthru = No
Track 2 : False Act on Train Stop = No
Track 2 : EX Limiting Used = Yes
Track 2 : EZ Correction Used = Yes

ISLAND: track 1
Track 1 : IslFrequency = 15.2 kHz
Track 1 : Pickup Delay (2s +) = 0 sec
Track 1 : IslEnable IP Used = No

ISLAND: track 2
Track 2 : IslFrequency = 13.2 kHz
Track 2 : Pickup Delay (2s +) = 0 sec
Track 2 : IslEnable IP Used = No

AND: track Anding
AND 1 XR Used = Yes
AND 2 Used = No
AND 3 Used = No
AND 4 Used = No
AND 5 Used = No
AND 6 Used = No
AND 7 Used = No
AND 8 Used = No

AND: AND 1 XR
AND 1 XR Track 1 = Prime
AND 1 XR Track 2 = Prime
AND 1 Enable Used = Yes
And 1 Enable Pickup = 5 sec
AND 1 Enable Drop = 0 sec
AND 1 Wrap Used = No

ADVANCED: MS restart
MS/GCP Restart Used = No

4000 GCP PROGRAMMING SETUP

DESIGNED BY: TAH 11-15-13	NORFOLK SOUTHERN		
DRAWN BY: RSD 11-15-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA.	M.P.: D-422.78	
CHECKED BY: RRD 11-15-13	HARVEL, IL FLGS AT 24TH AVE.		
IN SERVICE: - -	BROOKLYN	FILE No. R-	
	CADD or DWG. No. BKDS42278.07	SHEET No. 7 of 22	

REVISION INITIALS												

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

ADVANCED: out of service
OOS Control = Display+OOS IPs
OOS Timeout = Yes
OOS Timeout = 1 hrs

ADVANCED: out of service 2
T1 OOS Control = OOS Input 1
T2 OOS Control = OOS Input 1

ADVANCED: track wrap circuits
Wrap LOS Timer = 5 sec
Track 1 Wrap Used = No
Track 2 Wrap Used = No

ADVANCED: trk 1 overrides
Track 1 : All Predictors Override Used = No

ADVANCED: trk 2 overrides
Track 2 : All Predictors Override Used = No

ADVANCED: OR logic
OR 1 Used = No
OR 2 Used = No
OR 3 Used = No
OR 4 Used = No

ADVANCED: Internal I/O 1
Pass Thrus = No
Int.1 Sets = Not Used
Int.1 Set by = Not Used
Int.2 Sets = Not Used
Int.2 Set by = Not Used
Int.3 Sets = Not Used
Int.3 Set by = Not Used
Int.4 Sets = Not Used
Int.4 Set by = Not Used

ADVANCED: Internal I/O 2
Int.5 Sets = Not Used
Int.5 Set by = Not Used
Int.6 Sets = Not Used
Int.6 Set by = Not Used
Int.7 Sets = Not Used
Int.7 Set by = Not Used
Int.8 Sets = Not Used
Int.8 Set by = Not Used

ADVANCED: Internal I/O 3
Int.9 Sets = Not Used
Int.9 Set by = Not Used
Int.10 Sets = Not Used
Int.10 Set by = Not Used
Int.11 Sets = Not Used
Int.11 Set by = Not Used
Int.12 Sets = Not Used
Int.12 Set by = Not Used

ADVANCED: Internal I/O 4
Int.13 Sets = Not Used
Int.13 Set by = Not Used
Int.14 Sets = Not Used
Int.14 Set by = Not Used
Int.15 Sets = Not Used
Int.15 Set by = Not Used
Int.16 Sets = Not Used
Int.16 Set by = Not Used

ADVANCED: site options
Daylight Savings = On
Units = Standard
Maint Call Rpt IP Used = No
Emergency Activate IP = No
EZ/EX Logging = Change
EZ/EX Point Change = 3

SSCC
Gates Used = Yes
SSCC1+2 GPs Coupled = Yes
Min Activation = 0 sec
Rmt Activation Cancel = 2 min
Bell On Gate Rising = No
Mute Bell On Gate Down = No
SSCC IV Controller Used = No

SSCC: 1
SSCC-1 Activation = AND 1 XR
SSCC-1 Gate Delay = 6 sec
SSCC-1 Number of GPs = 1
SSCC-1 Number of GDs = 2
SSCC 1 : Flash Rate = 40
SSCC 1 : Low Battery Detection = No
SSCC 1 : Flash Sync = master
SSCC 1 : Invert Gate Output = No
SSCC 1 : Lamp Neutral Test = Off
Aux-1 Xng Ctrl Used = No

SSCC: 2
SSCC-2 Activation = AND 1 XR
SSCC-2 Gate Delay = 6 sec
SSCC-2 Number of GPs = 0
SSCC-2 Number of GDs = 0
SSCC 2 : Flash Rate = 40
SSCC 2 : Low Battery Detection = No
SSCC 2 : Flash Sync = slave
SSCC 2 : Invert Gate Output = No
SSCC 2 : Lamp Neutral Test = Off
Aux-2 Xng Ctrl Used = No

OUTPUT: assignment page 1
OUT 1.1 = Not Used
OUT 1.2 = Not Used
OUT 2.1 = Not Used
OUT 2.2 = Not Used

INPUT: assignment page 1
IN 1.1 = T1 Prime UAX
IN 1.2 = Not Used
IN 2.1 = Not Used
IN 2.2 = Not Used

IO: assignment SSCC
OUT GC 1 = Gate Output 1
OUT GC 2 = Gate Output 2
IN 7.1 = Not Used
IN 7.2 = GD 1.2
IN 7.3 = AND 1 XR Enable
IN 7.4 = GD 1.1
IN 7.5 = GP 1.1
IN 8.1 = Out Of Service IP 1
IN 8.2 = Not Used
IN 8.3 = Not Used
IN 8.4 = Not Used
IN 8.5 = Not Used

SEAR
SEAR Subnode = 3
DI 1 = Not Used
DI 2 = Not Used
Rly 1 = AC Control
Rly 2 = Not Used

SEAR: Inputs
SP 2.1 = POK 1
SP 3.1 = Not Used
SP 4.1 = Not Used
SP 5.1 = Not Used
SP 6.1 = Not Used

SEAR: slot 1-4 Inputs
IN 1.2 = Not Used
IN 2.1 = Not Used
IN 2.2 = Not Used
IN 3.1 = Not Used
IN 3.2 = Not Used
IN 4.1 = Not Used
IN 4.2 = Not Used

SEAR: Inputs slot 5
IN 5.1 = Not Used
IN 5.2 = Not Used

SEAR: Inputs slot 6
IN 6.1 = Not Used
IN 6.2 = Not Used

SEAR: slot 7-8 Inputs
IN 7.1 = Not Used
IN 8.2 = Not Used
IN 8.3 = Not Used
IN 8.4 = Not Used
IN 8.5 = Not Used

SITE: programming
Radio Subnode = 1
Field Password = Off
Low Battery Enabled = Off

Configuration Package File

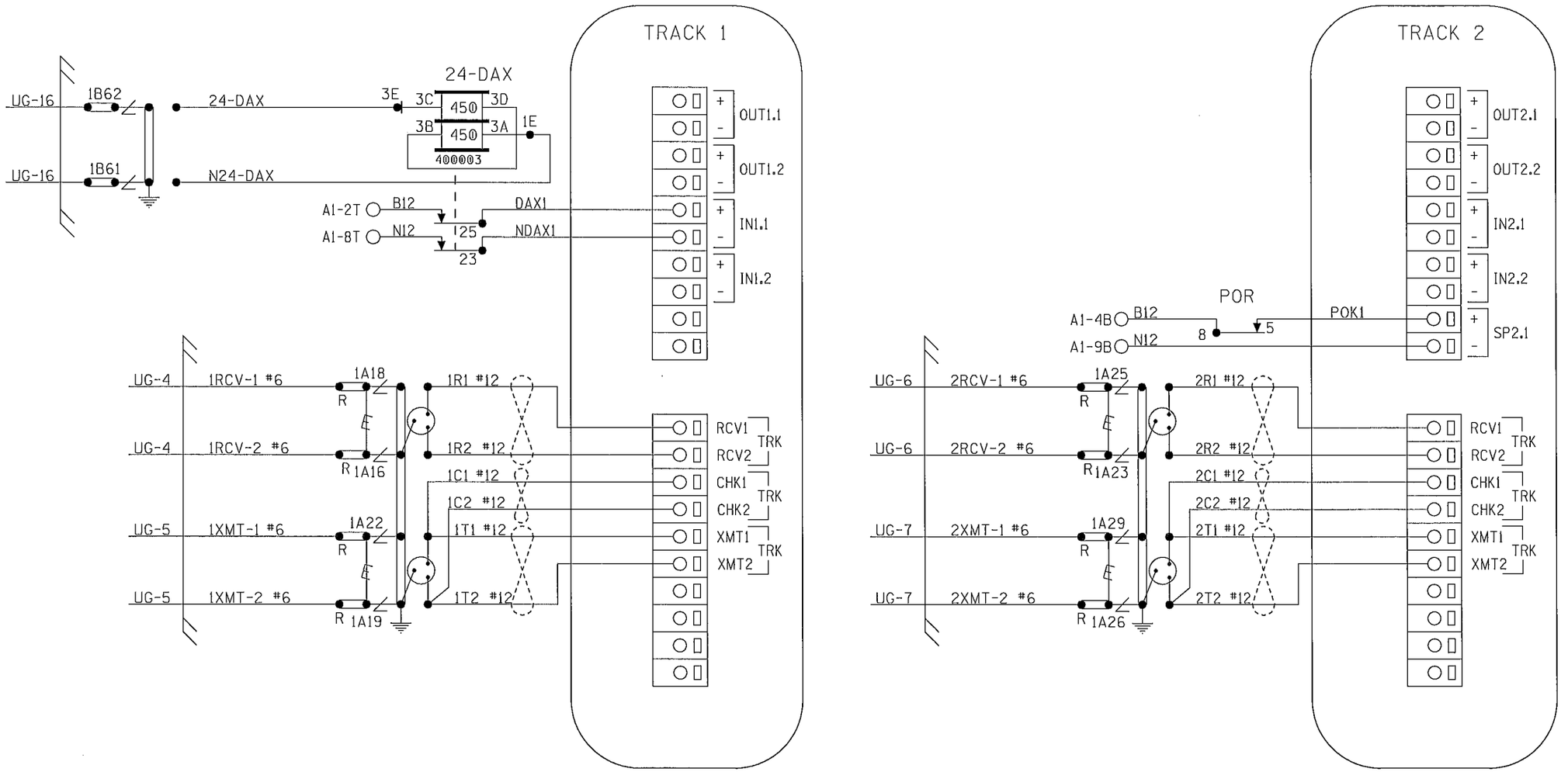
Filename: BKDS42278.pac

4000 GCP PROGRAMMING SETUP

DESIGNED BY: TAH 11-15-13	NORFOLK SOUTHERN
DRAWN BY: RSD 11-15-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: D-422.78
CHECKED BY: RRD 11-15-13	HARVEL, IL FLGS AT 24TH AVE.
IN SERVICE: - -	BROOKLYN — FILE No. R-
	CADD or DWG. No. BKDS42278.08 — SHEET No. 8 of 22

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.



CONNECTORS FOR TRACK MODULES

NOTES:
ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.

= TWIST

DESIGNED BY:	TAH 11-15-13
DRAWN BY:	RSD 11-15-13
CHECKED BY:	RRD 11-15-13
IN SERVICE:	- -

NORFOLK SOUTHERN

OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. M.P.: D-422.78

HARVEL, IL
FLGS AT 24TH AVE.

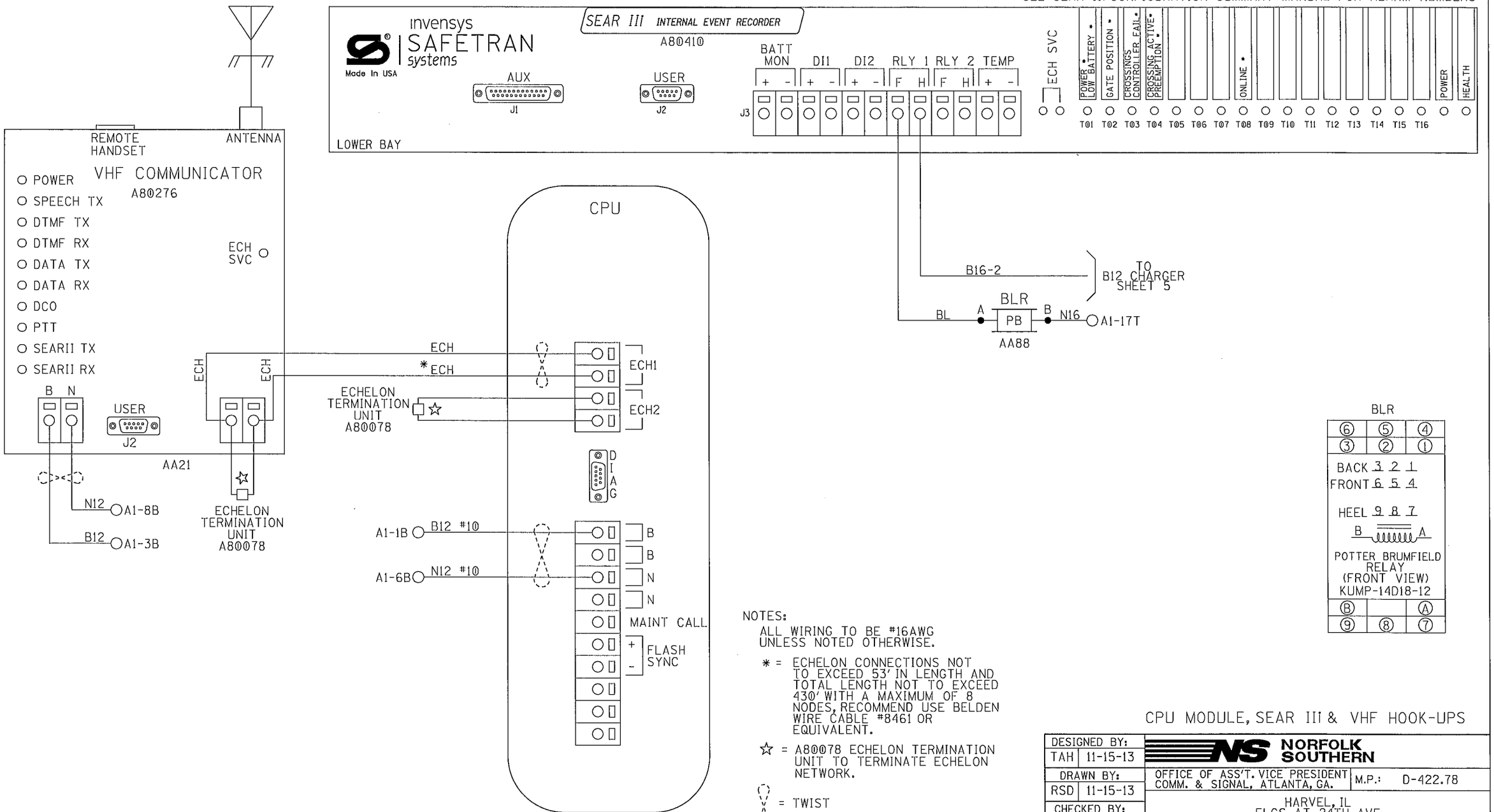
BROOKLYN FILE No. R-

CADD or DWG. No. BKDS42278.09 SHEET No. 9 of 22

REVISION INITIALS

PROPERTY
NORFOLK SOUTHERN RAILWAY CO.

* SEE SEAR III CONFIGURATION SUMMARY MANUAL FOR ALARM NUMBERS



BLR

NOTES:

ALL WIRING TO BE #16AWG UNLESS NOTED OTHERWISE.

* = ECHELON CONNECTIONS NOT TO EXCEED 53' IN LENGTH AND TOTAL LENGTH NOT TO EXCEED 430' WITH A MAXIMUM OF 8 NODES, RECOMMEND USE BELDEN WIRE CABLE #8461 OR EQUIVALENT.

☆ = A80078 ECHELON TERMINATION UNIT TO TERMINATE ECHELON NETWORK.

= TWIST

CPU MODULE, SEAR III & VHF HOOK-UPS

DESIGNED BY: TAH 11-15-13	NORFOLK SOUTHERN
DRAWN BY: RSD 11-15-13	OFFICE OF ASS'T. VICE PRESIDENT COMM. & SIGNAL, ATLANTA, GA. — M.P.: D-422.78
CHECKED BY: RRD 11-15-13	HARVEL, IL FLGS AT 24TH AVE.
IN SERVICE: - -	BROOKLYN — FILE No. R-
	CADD or DWG. No. BKDS42278.10 — SHEET No. 10 of 22

REVISION INITIALS

PROPERTY NORFOLK SOUTHERN RAILWAY CO.